

TRANSPORTATION AND THROUGHPUT

1. Introduction

This lesson discusses how transportation and throughput are affected by outside influences and the equipment required to support the off-load and delivery of the MPF items to the arrival and assembly operation element (AAOE).

2. Definitions

- a. Transportation. A means of conveyance or travel from one place to another by aircraft, motor transport, railroad, water, or pipeline.
- b. Throughput. A measure of the amount of materiel passing through a processing point within a specified period of time.

3. Factors Affecting Transportation and Throughput

- a. Quantity, capacity, and speed of available transportation.
- b. Environmental factors influencing the operational characteristics of the transportation, including
 - (1) terrain
 - (2) weather and climate
 - (3) road conditions:
 - (a) width
 - (b) surface quality
 - (c) traffic
 - (d) bridges and tunnels.
- c. Distances between origins and destinations
- d. Loading and unloading capabilities
- e. Equipment reliability
- f. Maintenance capabilities
- g. Turnaround time
- h. Route capacity
- i. Local government regulations
- j. Simultaneous berthing capability
- k. Pierside space for off-load and staging.

4. Transportation and Throughput Material and Equipment Onboard Maritime Pre-positioning Ships (MPS)

NAVMC 2907 lists the specific transportation and throughput material and equipment loaded onboard the MPSRON:

- a. Vehicles
- b. Containers
- c. Bulk fuel
- d. Bulk water.

5. Ship-to-Shore Movement in Maritime Pre-positioning Force (MPF) Operations

The Navy support element (NSE) is responsible for movement to the high-water mark.

- a. Causeway section, powered (CSP)
 - (1) Provides motive power for causeway ferries
 - (2) Capacity: 70 tons
 - (3) Maximum speed: 7 knots (empty), 5 knots(full)
 - (4) Maximum range: 70 nautical miles
 - (5) MPSRON 2: 15 sections
 - (6) MPSRON 1 and 3: 16 sections.

- b. Causeway section, non-powered (CSNP)
 - (1) Major component of the causeway ferry
 - (2) Capacity: 100 tons
 - (3) Composed of two types:
 - (a) Intermediate section
 - 1 MPSRON 2: 10 sections
 - 2 MPSRON 1 and 3: 8 sections

 - (b) Beach end: Intermediate sections modified to allow vehicles to drive on or off a beached ferry:
 - 1 MPSRON 2: 15 sections
 - 2 MPSRON 1 and 3: 16 sections.

- c. Causeway ferry
 - (1) Assemblages of various numbers of CSNPs and CSPs
 - (2) Configured as a ratio of CSNPs to CSPs (e.g., 3 + 1 or 1 + 1)
 - (3) Most efficient configuration depends on the distance to the beach, ferry section availability, and load priority. However, the Center of Naval Analysis has determined the optimal configuration to be 2 + 1.

 - (4) Principal lightering of ship-to-shore movement of an in-stream off-load.

- d. Side loadable warping tug (SLWT)
 - (1) CSP with an A-frame and winch
 - (2) Assist craft; not available for cargo movement
 - (3) Assists in the deployment, tending, and retrieval of the bulk storage fuel/water hoses
 - (4) One per ship.

- e. Lighter, amphibious resupply, cargo (LARC V)
 - (1) Provided to assist beach party teams in the salvage of lighters
 - (2) Four per MPSRON (on flagship and alternate flagship)
 - (3) Safety vehicle for amphibious assault vehicle (AAV) splashes.

- f. Landing craft, mechanized MK 8 (LCM-8)
 - (1) Used for discharge of vehicles, emplacement of fender system alongside ships, and transfer of personnel
 - (2) Capacity: 65-75 tons, depending on construction and modifications
 - (3) Maximum speed: 12 knots (empty), 9 knots (fully loaded)
 - (4) Two per ship.

- g. Roll-on/roll-off (RO/RO) discharge facility (RRDF)
 - (1) Six CSNPs joined into a platform, 3 wide and 2 long. A minimum of three ships is required to construct an RRDF because each ship carries only two causeway sections, non-powered, specially configured for RRDF construction.
 - (2) A self-sustaining RO/RO ship can position the ramp on this platform for vehicle off-load. The vehicles then move onto a barge ferry.
 - (3) Limits: sea state one.

- h. Fuel and water discharge (ship's systems)
 - (1) Amphibious assault bulk fuel system (AABFS)
 - (a) Two six-inch fuel discharge hose reels per MPS
 - (b) Fuel discharging: 700 gallons per minute at 5,000 ft, 300 gallons per minute at 10,000 feet (both reels connected)
 - (c) Each reel is 5,000 feet.

 - (2) Amphibious assault bulk water system (AABWS)
 - (a) One four-inch water discharge hose reel per MPS
 - (b) Water discharging: 300 gallons per minute
 - (c) Each reel is 10,000 feet.

- i. Environmental factors affecting ship-to-shore movement

- (1) Obstacles: bars, shoals, reefs, rocks, wrecks
- (2) Area size: depth, length, free-swinging area
- (3) Sea state
- (4) Surf conditions
- (5) Inland waterways
- (6) Weather.

j. Civil engineering support equipment (CESE)

- (1) Rolling stock and engineering equipment for camp support and off-load operations
- (2) Approximately 20 pieces per ship.

6. Overland Movement in MPF Operations

a. Material handling equipment aboard MPS

- (1) Rough terrain container handler (RTCH): 14 per MPSRON
- (2) Rough terrain crane (RTC): 25 tons, 8 per MPSRON
- (3) Extended boom forklift (EBFL): 46 per MPSRON
- (4) Forklift: 4,000 pounds, 24 per MPSRON
- (5) Forklift attachment: 10,000 pounds, 37 per MPSRON
- (6) Crane rough terrain hydraulic light: 7.5 tons, 16 per MPSRON.

b. Motor transport equipment aboard MPS

(1) Container transporters

(a) Logistics Vehicle System (LVS)

- 1 Container hauler, MK 14: 53 per MPSRON
- 2 Wrecker/recovery, MK 15: 4 per MPSRON
- 3 Fifth wheel, MK 16: 15 per MPSRON
- 4 Cargo hauler, MK 17: 17 per MPSRON
- 5 Bridge hauler, MK 18: 20 per MPSRON

(b) MK 48 power units: 109 per MPSRON.

(a) Bulk fuel transporters

(a) Semitrailer, refueler, M970 with truck, tractor, M931

- 1 Capacity:
 - (a) Unimproved road: 3,000 gallons
 - (b) Highway: 5,000 gallons
- 2 26 M970 trailers aboard MPSRON

3 27 M931 5-ton tractor trucks per MPSRON.

(b) Fuel Transporters

(a) Logistics vehicle system with fuel modules

1 Storage tank SIXCON fuel:

(a) Capacity: 900 gallons

(b) Quantity: 49 per MPSRON

2 Pump module fuel SIXCON:

(a) Capacity: 125 gallons per minute

(b) Quantity: 24 per MPSRON

3 LVS fuel module capacities:

- Cross country: Two storage modules and one pump module
- Highway: Four storage modules and one pump module.

(c) Water transporters

(a) Logistic vehicle system with water modules

1 Storage tank SIXCON water:

(a) Capacity: 900 gallons

(b) Quantity: 215 per MPSRON

2 Pump module water SIXCON:

(a) Capacity: 125 gallons per minute

(b) Quantity: 55 per MPSRON

3 LVS water module capacities:

(a) Cross country: Two storage modules and one pump module

(b) Highway: Four storage modules and one pump module

(b) Trailer, tank, water, M149:

1 Capacity: 400 gallons

2 111 per MPSRON.

c. Amphibious assault fuel system (AAFS) pipelines

(1) Three miles of pipeline per AAFS

- (2) Designed to transfer 350 gallons per minute over terrain with an elevation differential not exceeding 260 feet
- (3) Eight systems on MPS-1 and MPS-3 and six systems on MPS-2. Each system comprises thirty 20,000-gallon bladders for a total capacity of 600,000 gallons per system.

d. Other throughput assets

- (1) Grader, road, motorized, 6 per MPSRON
- (2) D7G Caterpillar, 17 per MPSRON
- (3) Bridge scissor for Armor Vehicle Launch Bridge (AVLB), 2 per MPSRON
- (4) Armor vehicle launch bridge (AVLB), 2 per MPSRON
- (5) Truck, dump M929, 42 per MPSRON
- (6) AAV recovery, 4 per MPSRON
- (7) Light armored vehicle (LAV) maintenance recovery, 1 per MPSRON
- (8) Recovery vehicle track M88, 5 per MPSRON
- (9) Blade mine clearing, 8 per MPSRON
- (10) Tractor, full-tracked MC-1150, 12 per MPSRON
- (11) Raft set ribbon bridge, 2 per MPSRON
- (12) Tractor, full-tracked with a multiple-purpose bucket, 5 per MPSRON 1 & 3, 4 per MPSRON 2
- (13) Tractor, all-wheel drive, 6 per MPSRON.

7. Local Throughput Support

- a. Reduced usage of MPF equipment leads to higher combat readiness.
- b. May be required by local government; used to stimulate the local economy.
- c. May be coordinated through Military Traffic Management Command (MTMC) or host nation support agreements (HNSA). In Southwest Asia (SWA), MPF and joint forces used local national transportation to shuttle equipment throughout the area of operation.
- d. Types of throughput support:
 - (1) Port terminals
 - (2) Motor transport
 - (3) Railroads
 - (4) Pipelines
 - (5) Barges.
- e. Planning considerations
 - (1) Security
 - (2) Reliability
 - (3) Timeliness
 - (4) Compatibility with MPF cargo.